

Isolation of new *Klebsiella pneumoniae* phage PSKP16

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ABSTRACT

Background and Objectives: *Klebsiella pneumoniae* is a clinically relevant opportunistic pathogen belonging to the *Enterobacteriaceae* family. It is in the top three bacteria associated with antimicrobial resistance deaths globally, and one of the most dangerous bacteria causing nosocomial infections. Phage therapy offers a potential option for the treatment of drug-resistant bacterial infections.

Materials and Methods: Phage PSKP16 was isolated against *K. pneumoniae*, capsular type K2 (isolated from a wound infection). PSKP16 is a new lytic phage with a *Siphovirus*-like morphology.

Results: PSKP16 is a linear double stranded DNA phage with a GC content of 50% and genome size of 46,712 bp, for which we predicted 67 ORFs. PSKP16 belongs to the genus *Webervirus* and shows high evolutionary proximity to *Klebsiella* phages JY917, Sushi, and B1.

Conclusion: Phage isolation is fast, cheap and efficient, but it requires time and characterization (which adds expense) to ensure that the isolated phages do not pose a health risk, which is essential to safely use phage therapy to treat life-threatening bacterial infections.

Keywords: *Klebsiella pneumoniae*; Bacteriophages; Drug resistance; Infection control; High throughput nucleotide sequencing

INTRODUCTION

Klebsiella pneumoniae can lead to severe urinary tract infections, ulcers, respiratory, and sepsis (1-3). The presence of high antimicrobial resistance (AMR) in *K. pneumoniae*, along with the ability to produce biofilm, has led to a wide range of infections caused by *K. pneumoniae* (4, 5). The lack of effective treatment for *K. pneumoniae* infections has resulted in an increase in costs, hospitalizing, and mortality

(3, 6, 7). Today, due to the emergence of wide-spread AMR in *K. pneumoniae* (2, 8, 9) there is an increasing need to find new antimicrobial treatments, such as bacteriophage (phage) based therapies (10-14).

The need for new antimicrobials has fuelled a resurgence in phage isolation and research (14, 15). The discovery of new phages for use in phage therapy leads to different challenges and concerns, including the limited host range of phages compared to antibiotics, phage resistance, lysogenic conversion

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